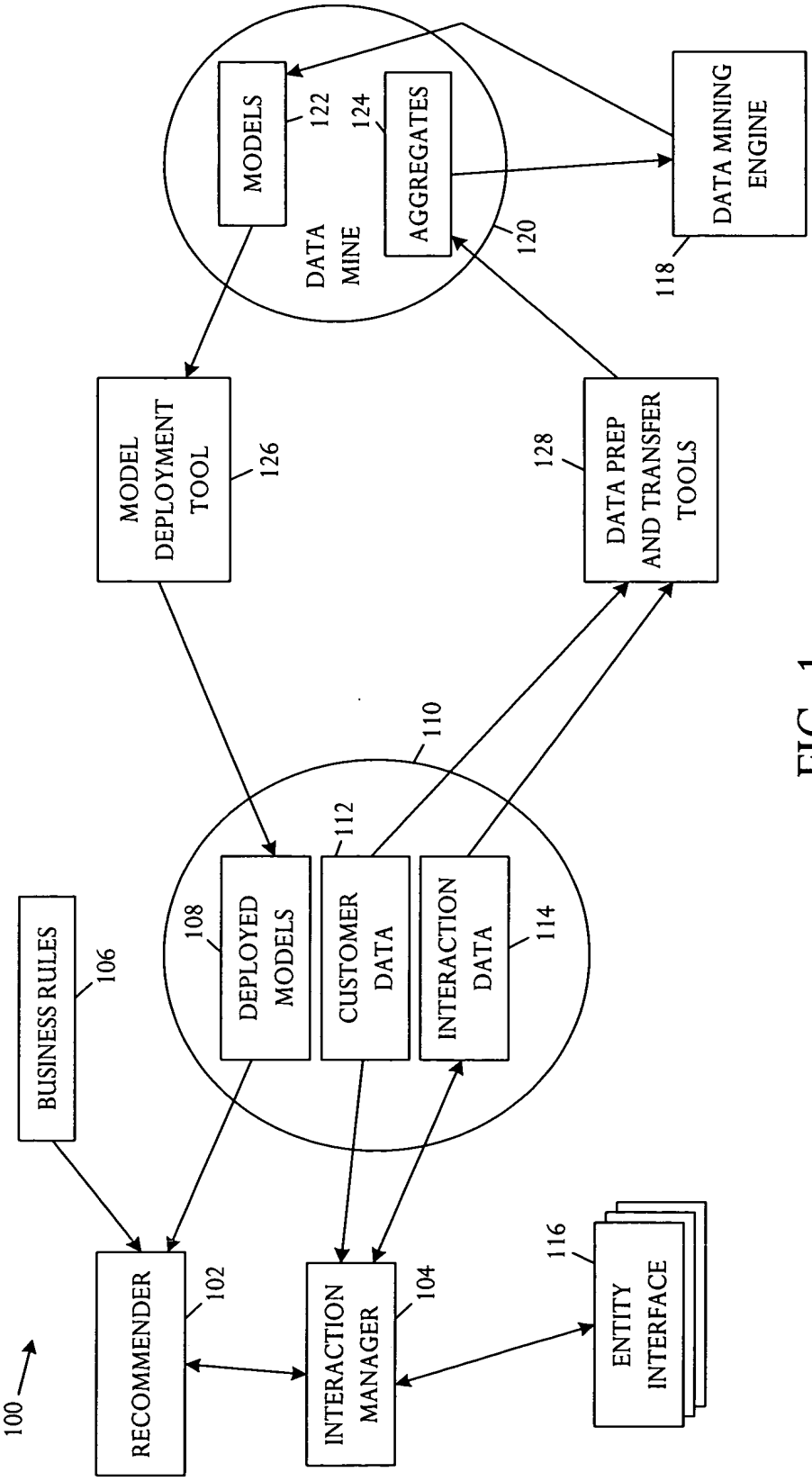
100
RECOMMENDER
102
INTERACTION MANAGER
104
ENTITY INTERFACE
116
BUSINESS RULES
106
DEPLOYED MODELS
108
CUSTOMER DATA
112
INTERACTION DATA
114
110
MODEL DEPLOYMENT TOOL
126
DATA PREP AND TRANSFER TOOLS
128
MODELS
122
AGGREGATES
124
DATA MINE
120
DATA MINING ENGINE
118

FIG. 1

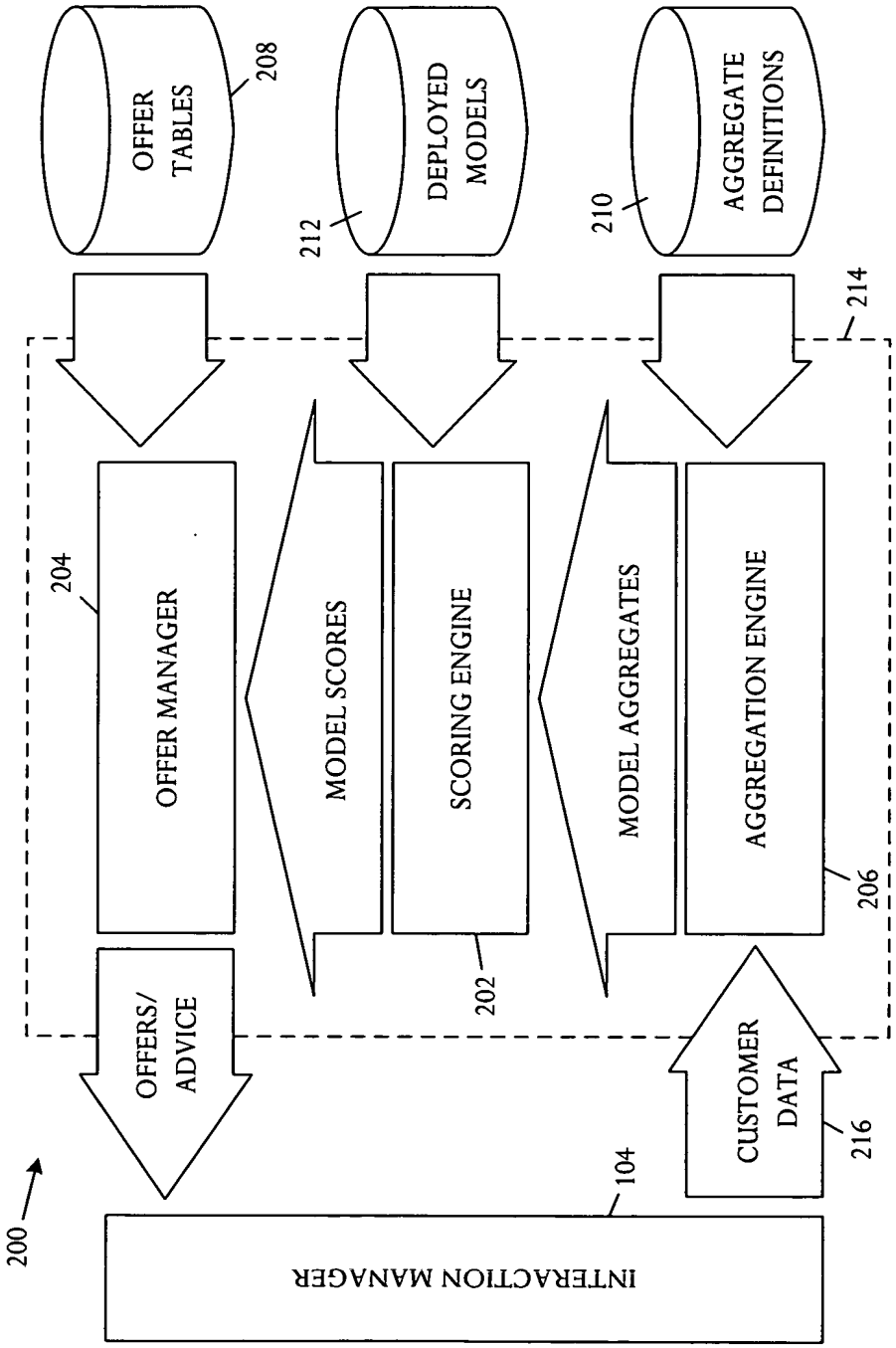
OFFER TABLES
208
DEPLOYED MODELS
212
AGGREGATE DEFINITIONS
210
214
OFFER MANAGER
204
MODEL SCORES
SCORING ENGINE
MODEL AGGREGATES
AGGREGATION ENGINE
206
202
OFFERS/ ADVICE
CUSTOMER DATA
216
104
INTERACTION MANAGER
200

FIG. 2

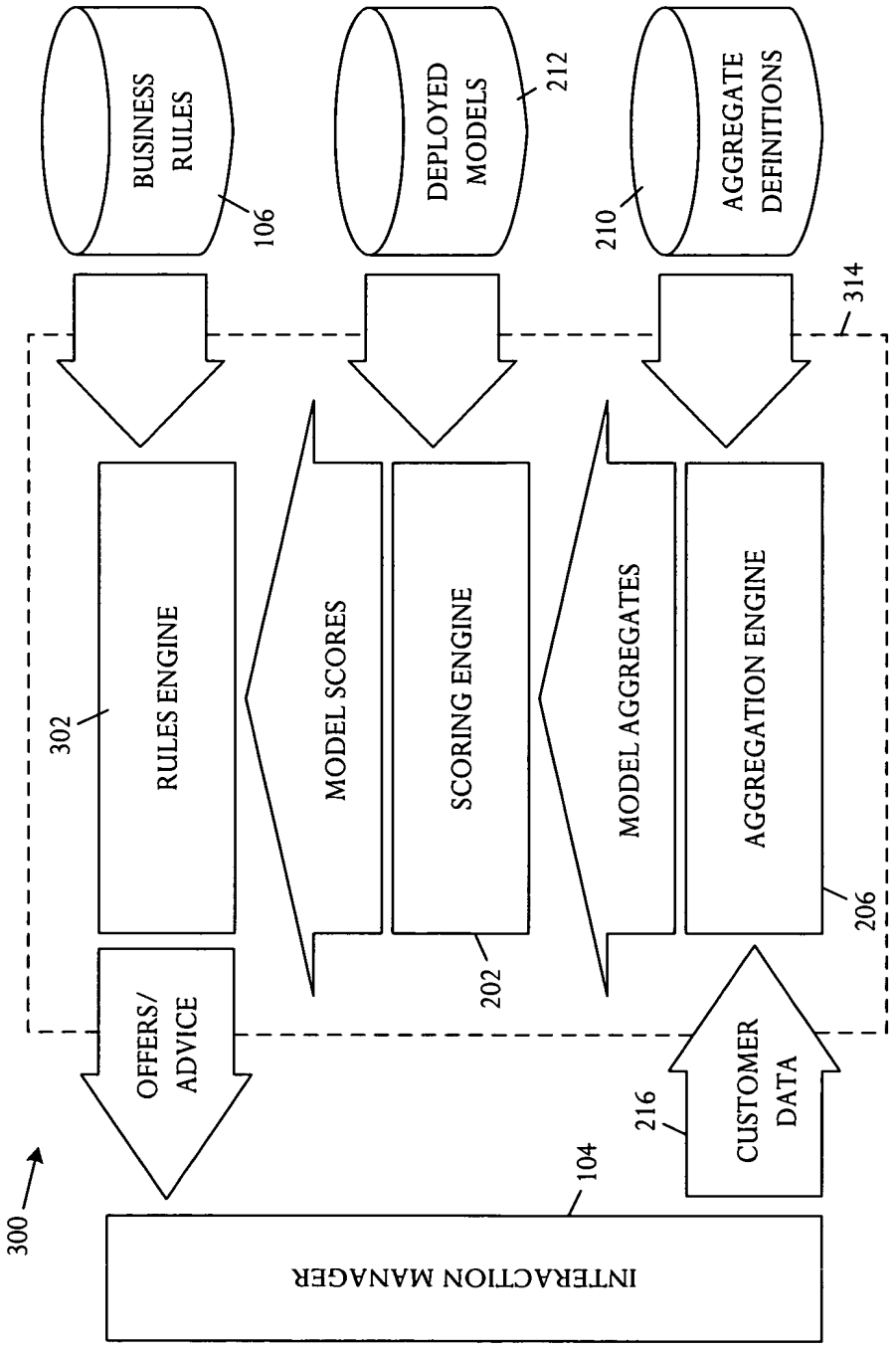
BUSINESS RULES
106
DEPLOYED MODELS
212
AGGREGATE DEFINITIONS
210
314
RULES ENGINE
302
MODEL SCORES
SCORING ENGINE
202
MODEL AGGREGATES
AGGREGATION ENGINE
206
OFFERS/ ADVICE
CUSTOMER DATA
216
104
INTERACTION MANAGER
300

FIG. 3

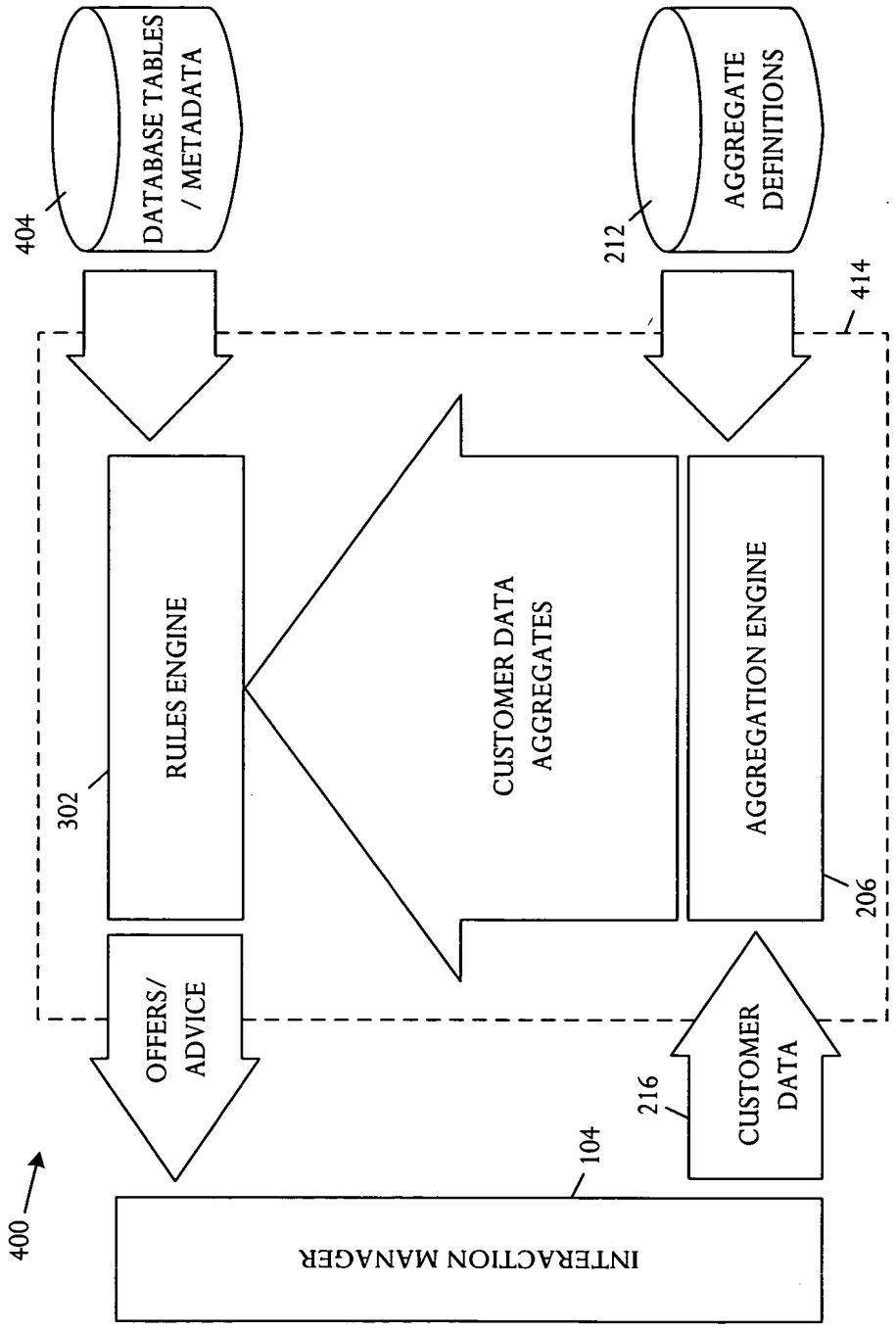
DATABASE TABLES / METADATA
404
AGGREGATE DEFINITIONS
212
414
RULES ENGINE
302
CUSTOMER DATA AGGREGATES
AGGREGATION ENGINE
206
OFFERS/ ADVICE
CUSTOMER DATA
216
104
INTERACTION MANAGER
400

FIG. 4

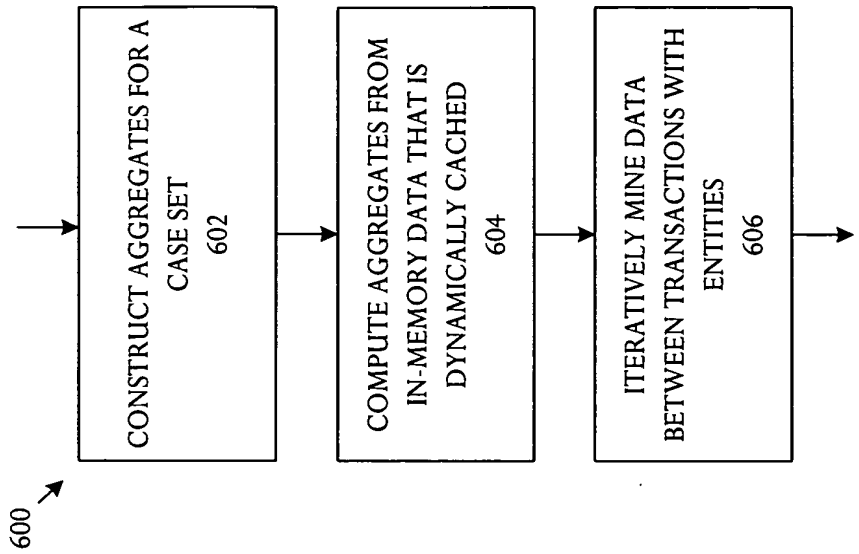
600
CONSTRUCT AGGREGATES FOR A CASE SET
602
COMPUTE AGGREGATES FROM IN-MEMORY DATA THAT IS DYNAMICALLY CACHED
604
ITERATIVELY MINE DATA BETWEEN TRANSACTIONS WITH ENTITIES
606

FIG. 6

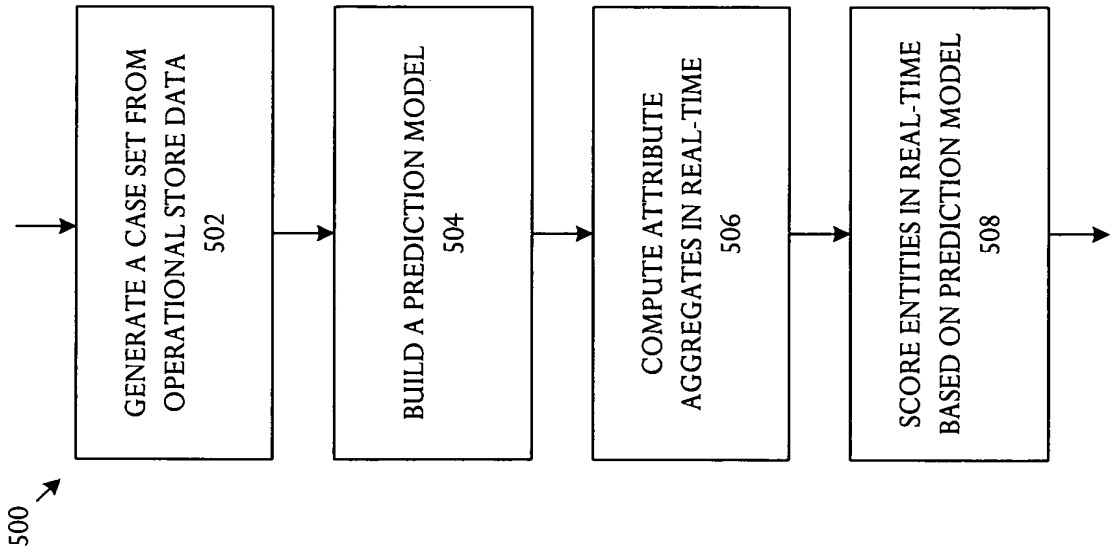
500
GENERATE A CASE SET FROM OPERATIONAL STORE DATA
502
BUILD A PREDICTION MODEL
504
COMPUTE ATTRIBUTE AGGREGATES IN REAL-TIME
506
SCORE ENTITIES IN REAL-TIME BASED ON PREDICTION MODEL
508

FIG. 5

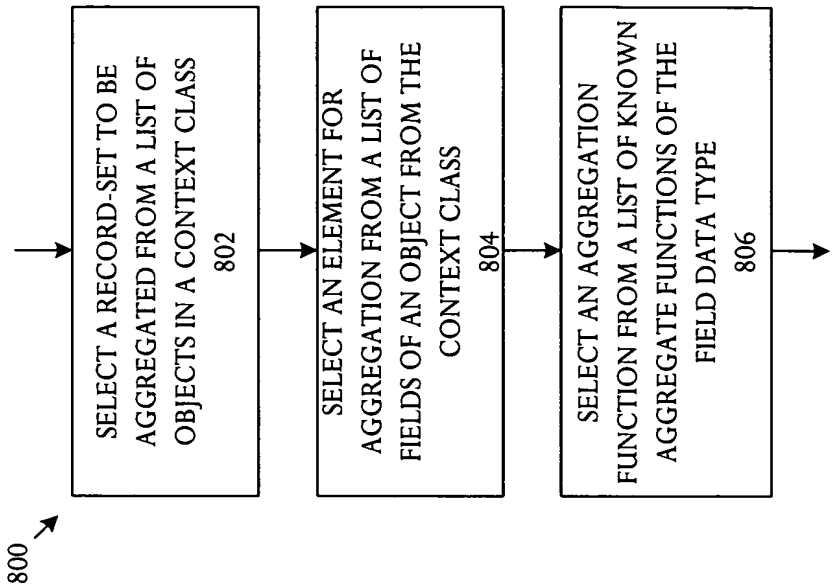
800
SELECT A RECORD-SET TO BE AGGREGATED FROM A LIST OF OBJECTS IN A CONTEXT CLASS
802
SELECT AN ELEMENT FOR AGGREGATION FROM A LIST OF FIELDS OF AN OBJECT FROM THE CONTEXT CLASS
804
SELECT AN AGGREGATION FUNCTION FROM A LIST OF KNOWN AGGREGATE FUNCTIONS OF THE FIELD DATA TYPE
806

FIG. 8

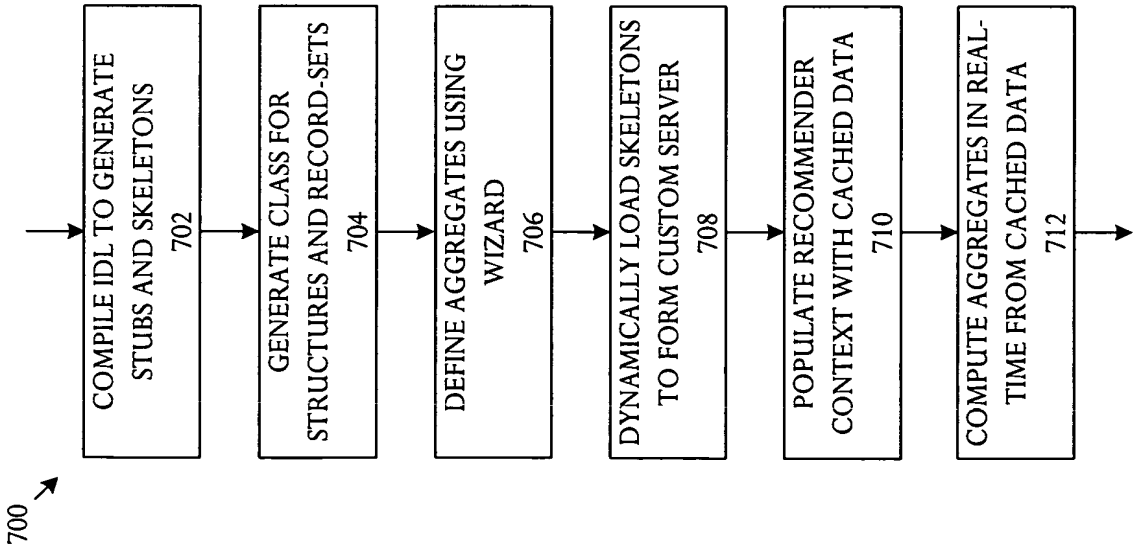
700
COMPILE IDL TO GENERATE STUBS AND SKELETONS
702
GENERATE CLASS FOR STRUCTURES AND RECORD-SETS
704
DEFINE AGGREGATES USING WIZARD
706
DYNAMICALLY LOAD SKELETONS TO FORM CUSTOM SERVER
708
POPULATE RECOMMENDER CONTEXT WITH CACHED DATA
710
COMPUTE AGGREGATES IN REAL-TIME FROM CACHED DATA
712

FIG. 7

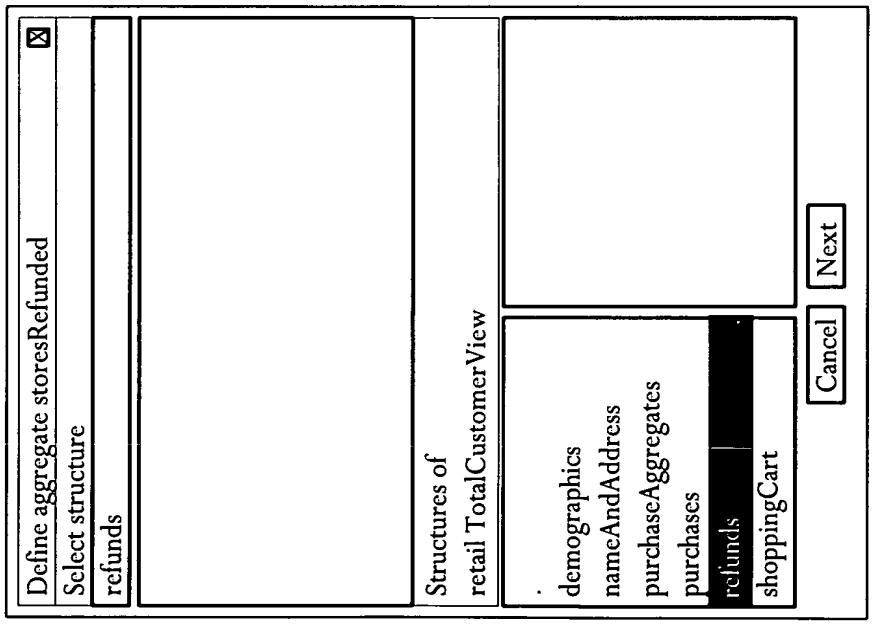
Define aggregate storesRefunded
Select structure
refunds
Structures of
retail TotalCustomerView
demographics
nameAndAddress
purchaseAggregates
purchases
refunds
shoppingCart
Cancel
Next

FIG. 9A

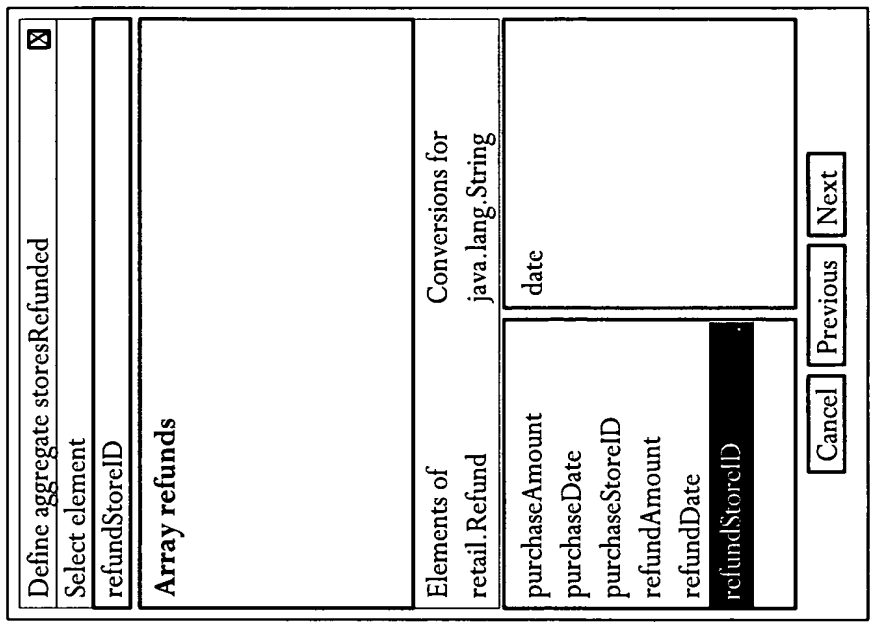
Define aggregate storesRefunded
Select element
refundStoreID
Array refunds
Elements of
retail.Refund
purchaseAmount
purchaseDate
purchaseStoreID
refundAmount
refundDate
refundStoreID
Conversions for
java.lang.String
date
Cancel
Previous
Next

FIG. 9B

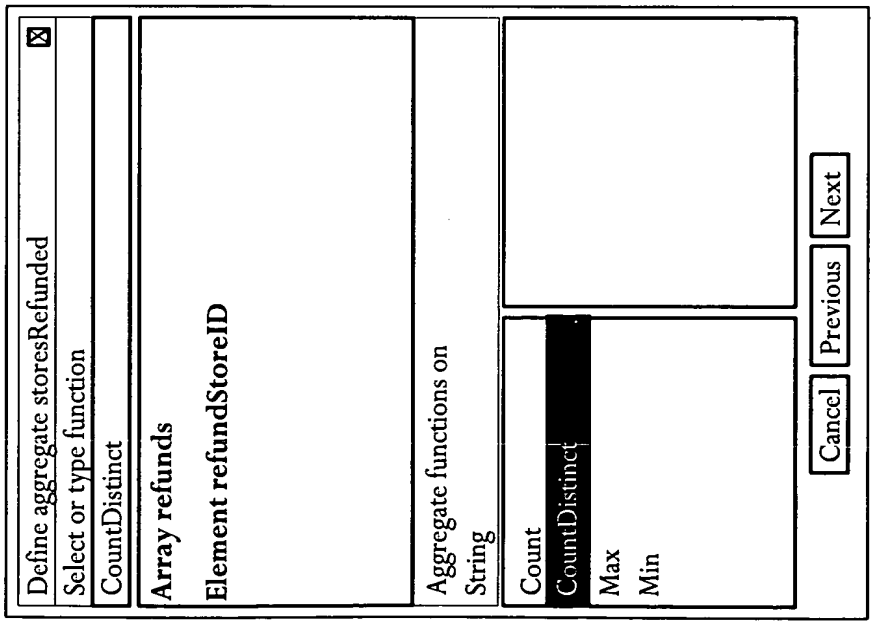
Define aggregate storesRefunded
Select or type function
CountDistinct
Array refunds
Element refundStoreID
Aggregate functions on String
Count
CountDistinct
Max
Min
Cancel
Previous
Next

FIG. 9C

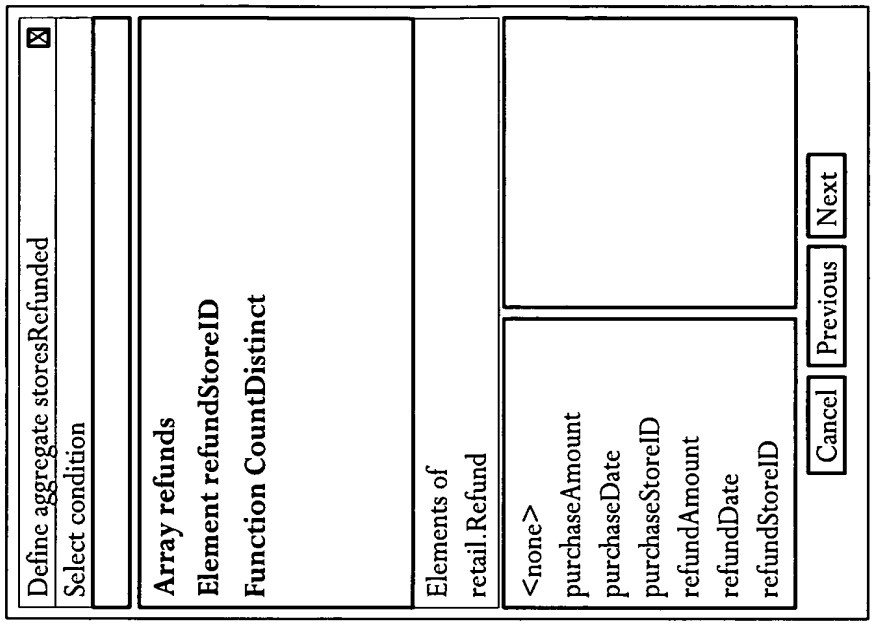
Define aggregate storesRefunded
Select condition
Array refunds
Element refundStoreID
Function CountDistinct
Elements of retail.Refund
<none>
purchaseAmount
purchaseDate
purchaseStoreID
refundAmount
refundDate
refundStoreID
Cancel
Previous
Next

FIG. 9D

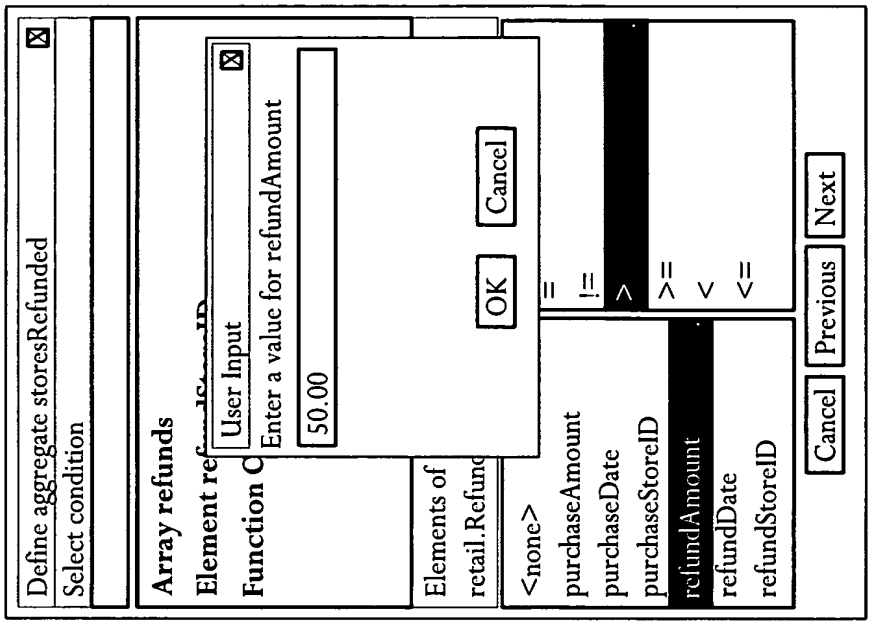
Define aggregate storesRefunded
Select condition
refundAmount
Array refunds
Element refundStoreID
Function CountDistinct
Elements of retail.Refund
Conversions & operators for java.lang.Number
<none>
purchaseAmount
purchaseDate
purchaseStoreID
refundAmount
refundDate
refundStoreID
= != > >= < <=
Cancel
Previous
Next

FIG. 9E

Define aggregate storesRefunded
Select condition
Array refunds
User Input
Enter a value for refundAmount
50.00
OK
Cancel
Elements of retail.Refund
<none>
purchaseAmount
purchaseDate
purchaseStoreID
refundAmount
refundDate
refundStoreID
= != > >= < <=
Cancel
Previous
Next

FIG. 9F

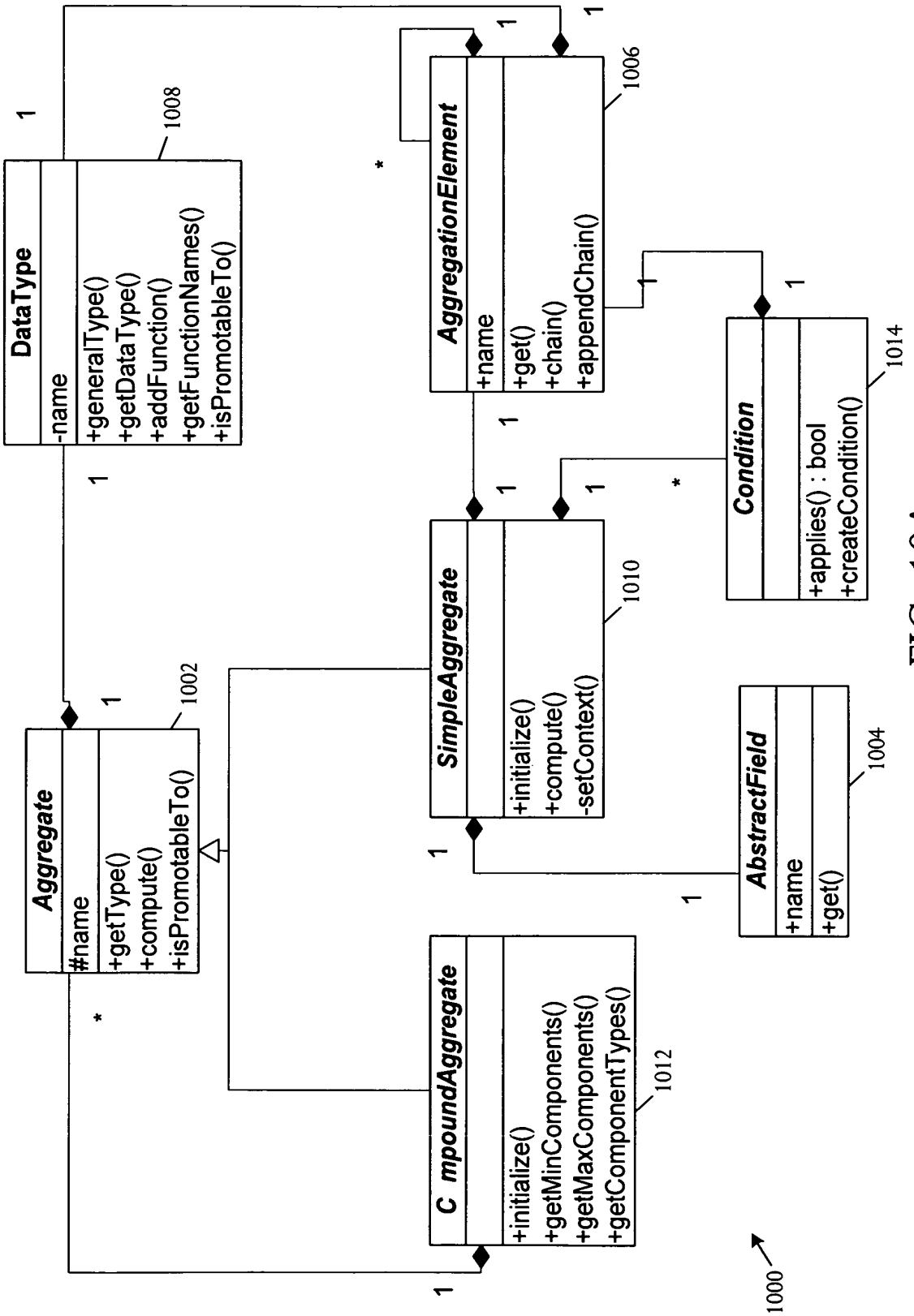
DataType
-name
+generalType()
+getDataType()
+addFunction()
+getFunctionNames()
+isPromotableTo()
1008
AggregationElement
+name
+get()
+chain()
+appendChain()
1006
Condition
+applies() : bool
+createCondition()
1014
Aggregate
#name
+getType()
+compute()
+isPromotableTo()
1002
SimpleAggregate
+initialize()
+compute()
-setContext()
1010
AbstractField
+name
+get()
1004
CompoundAggregate
+initialize()
+getMinComponents()
+getMaxComponents()
+getComponentTypes()
1012
1000

FIG. 10A

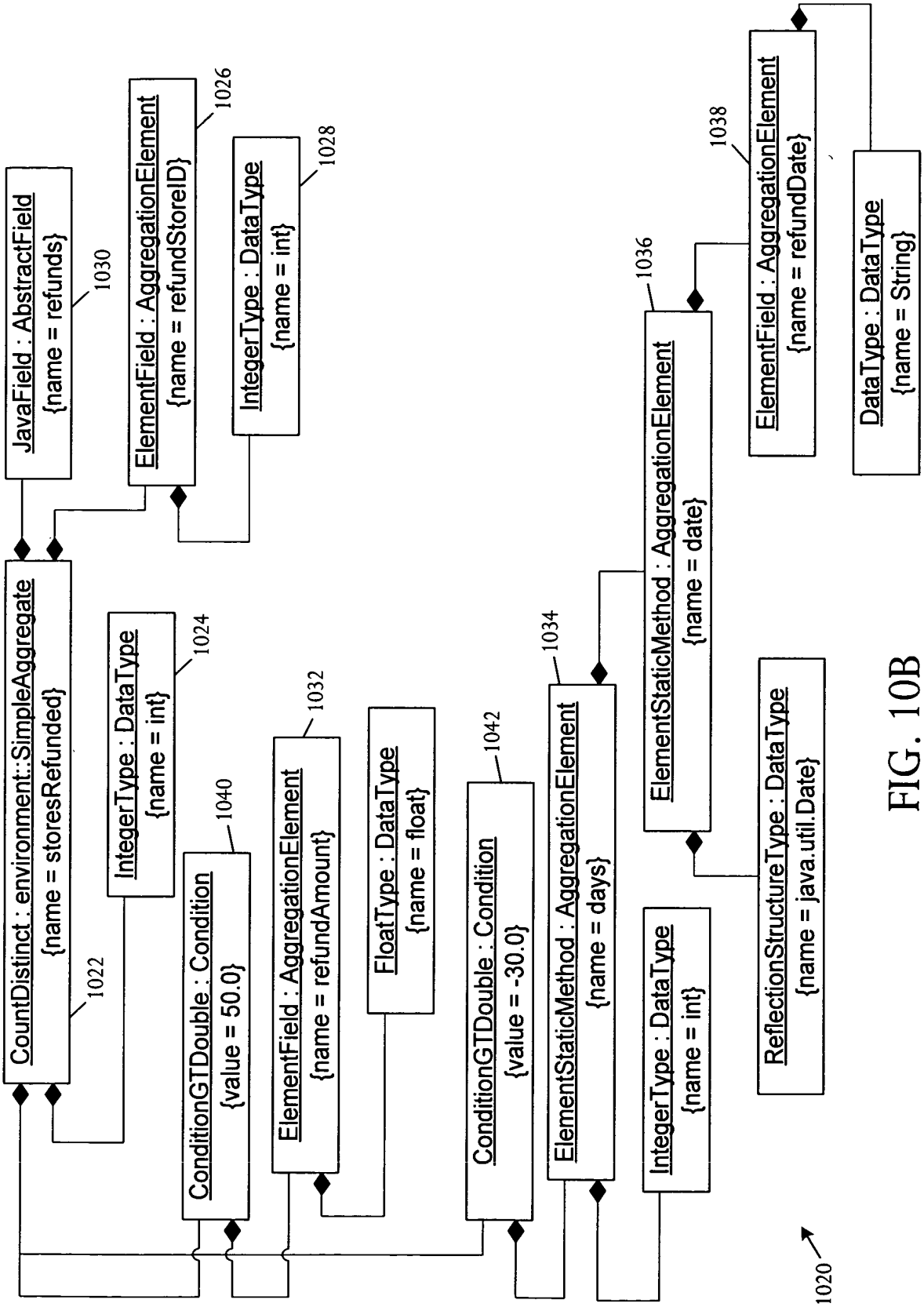
JavaField : AbstractField
{name = refunds}
1030
ElementField : AggregationElement
{name = refundStoreID}
1026
IntegerType : DataType
{name = int}
1028
CountDistinct : environment::SimpleAggregate
{name = storesRefunded}
1022
IntegerType : DataType
{name = int}
1024
ConditionGTDouble : Condition
{value = 50.0}
1040
ElementField : AggregationElement
{name = refundAmount}
1032
FloatType : DataType
{name = float}
ConditionGTDouble : Condition
{value = -30.0}
1042
ElementStaticMethod : AggregationElement
{name = days}
1034
ElementStaticMethod : AggregationElement
{name = date}
1036
ElementField : AggregationElement
{name = refundDate}
1038
DataType : DataType
{name = String}
IntegerType : DataType
{name = int}
ReflectionStructureType : DataType
{name = java.util.Date}
1020

FIG. 10B

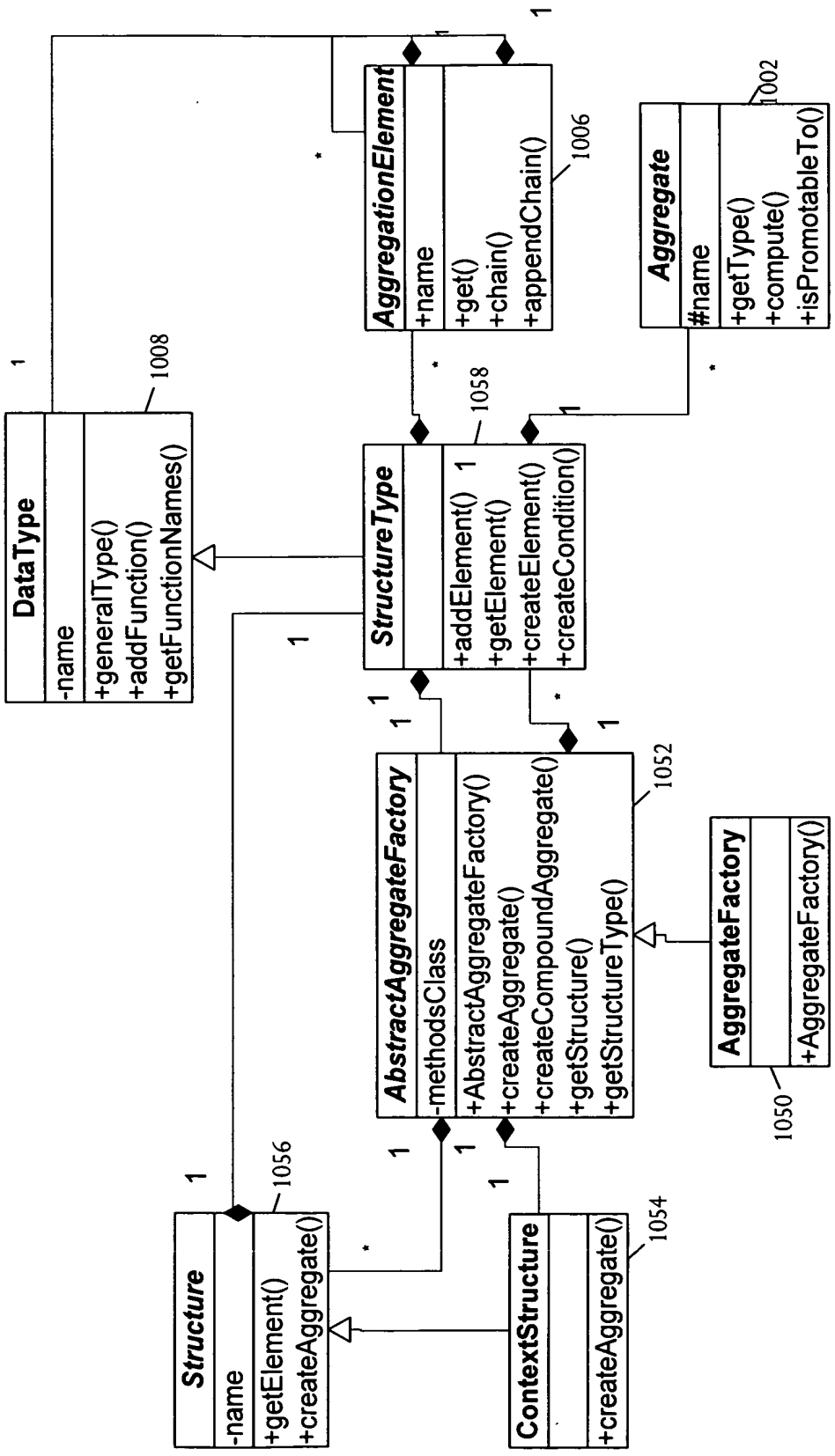
AggregationElement
+name
+get()
+chain()
+appendChain()
1006
Aggregate
#name
+getType()
+compute()
+isPromotableTo()
1002
DataType
-name
+generalType()
+addFunction()
+getFunctionNames()
1008
StructureType
+addElement()
+getElement()
+createElement()
+createCondition()
1058
AbstractAggregateFactory
-methodsClass
+AbstractAggregateFactory()
+createAggregate()
+createCompoundAggregate()
+getStructure()
+getStructureType()
1052
AggregateFactory
+AggregateFactory()
1050
Structure
-name
+getElement()
+createAggregate()
1056
ContextStructure
+createAggregate()
1054

FIG. 10C

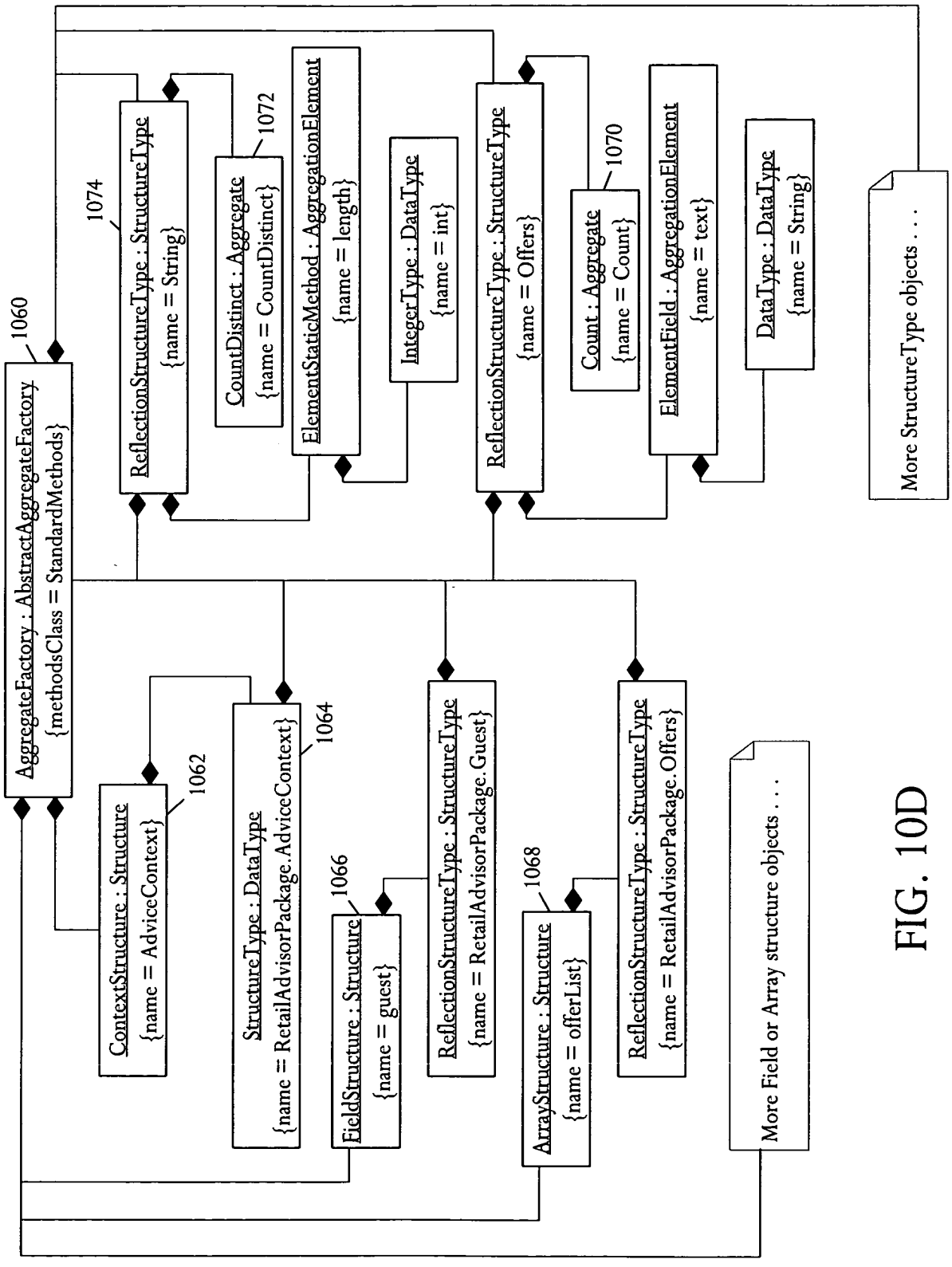
AggregateFactory : AbstractAggregateFactory
{methodsClass = StandardMethods}
1060
ReflectionStructureType : StructureType
{name = String}
1074
CountDistinct : Aggregate
{name = CountDistinct}
1072
ElementStaticMethod : AggregationElement
{name = length}
IntegerType : DataType
{name = int}
ReflectionStructureType : StructureType
{name = Offers}
Count : Aggregate
{name = Count}
1070
ElementField : AggregationElement
{name = text}
DataType : DataType
{name = String}
More StructureType objects . . .
ContextStructure : Structure
{name = AdviceContext}
1062
StructureType : DataType
{name = RetailAdvisorPackage.AdviceContext}
1064
FieldStructure : Structure
{name = guest}
1066
ReflectionStructureType : StructureType
{name = RetailAdvisorPackage.Guest}
ArrayStructure : Structure
{name = offerList}
1068
ReflectionStructureType : StructureType
{name = RetailAdvisorPackage.Offers}
More Field or Array structure objects . . .

FIG. 10D

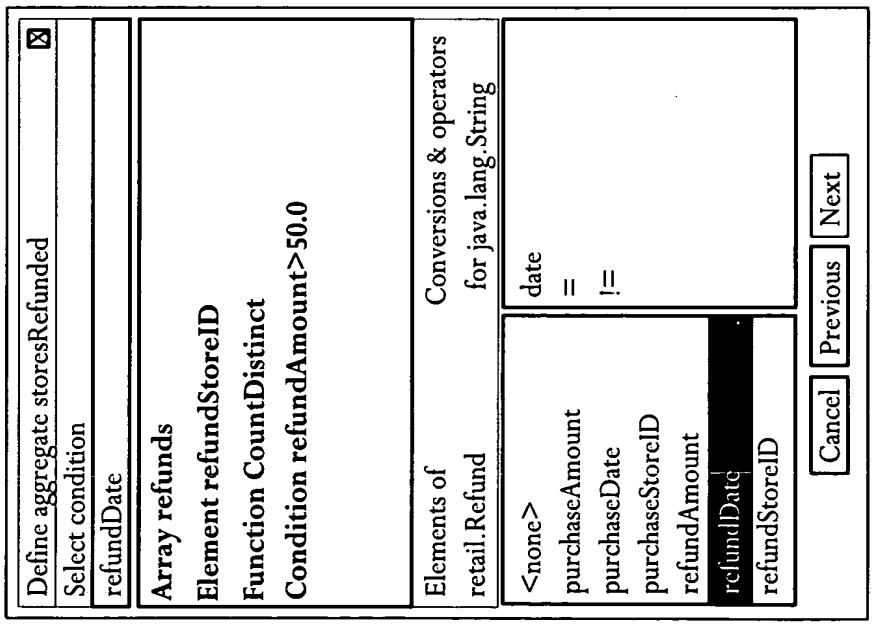

FIG. 11A

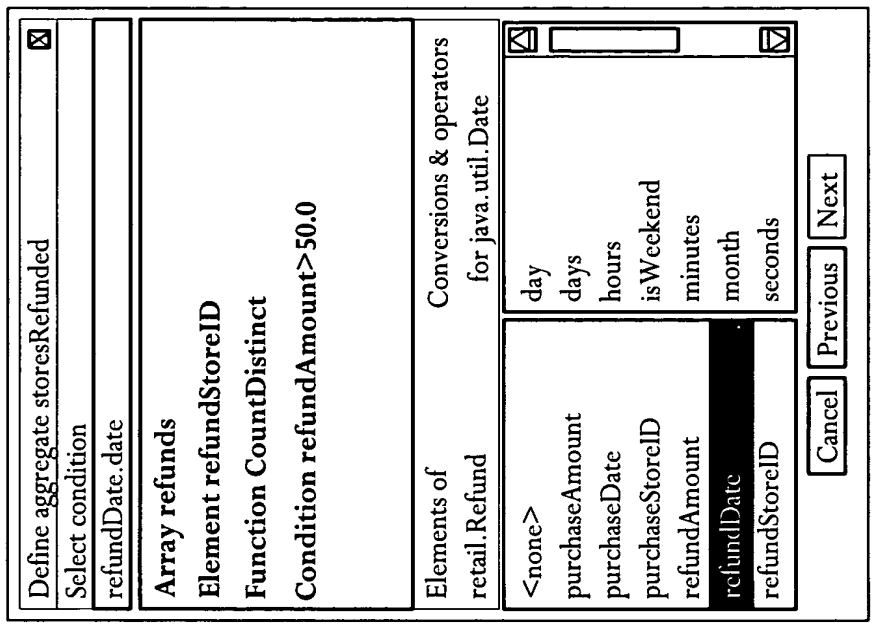

FIG. 11B

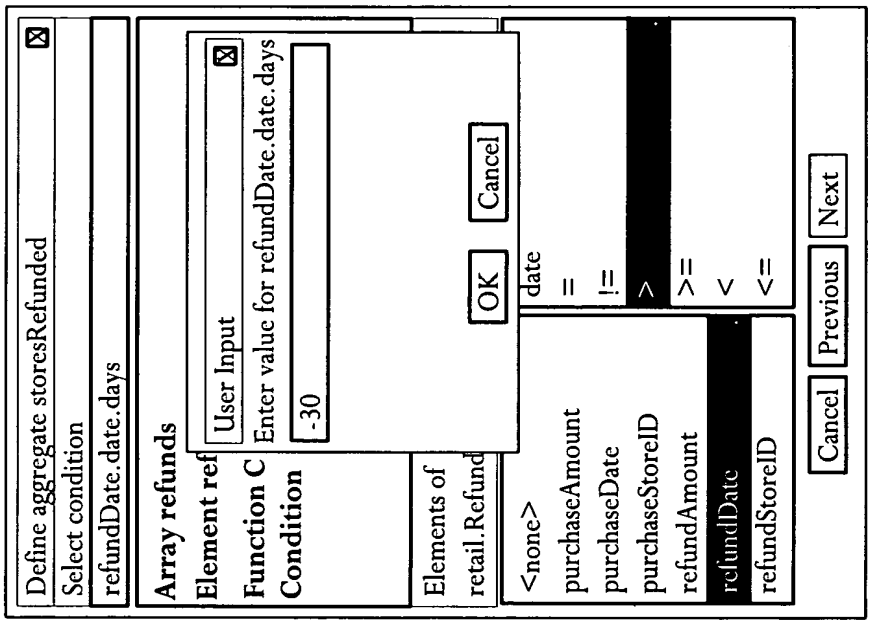
Define aggregate storesRefunded
Select condition
refundDate.date.days
Array refunds
Element ref
Function C
Condition
User Input
Enter value for refundDate.date.days
-30
OK
Cancel
Elements of
retail.Refund
<none>
purchaseAmount
purchaseDate
purchaseStoreID
refundAmount
refundDate
refundStoreID
date
=
!=
>
>=
<
<=
Cancel
Previous
Next

FIG. 11C

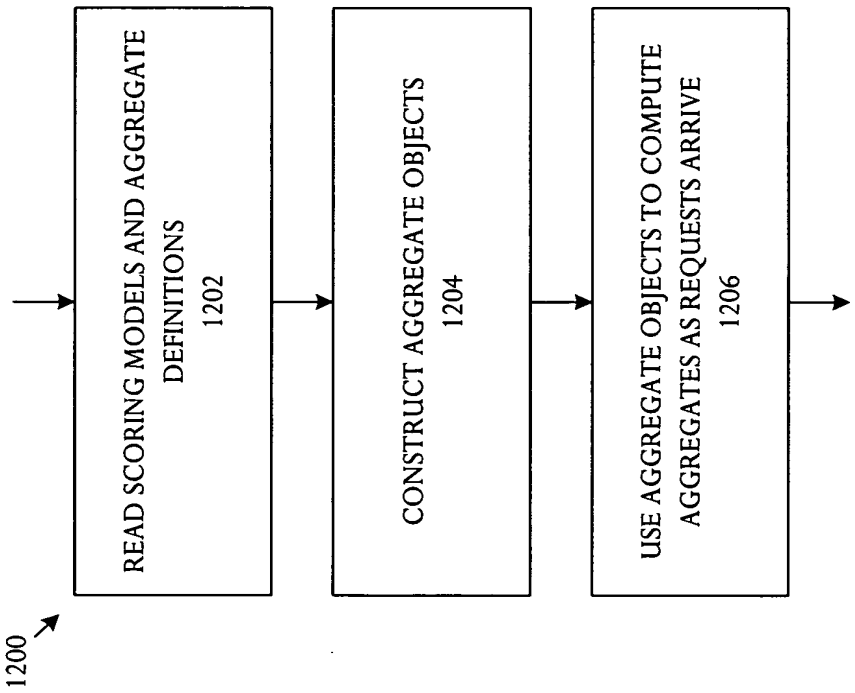
READ SCORING MODELS AND AGGREGATE DEFINITIONS
1202
CONSTRUCT AGGREGATE OBJECTS
1204
USE AGGREGATE OBJECTS TO COMPUTE AGGREGATES AS REQUESTS ARRIVE
1206
1200

FIG. 12

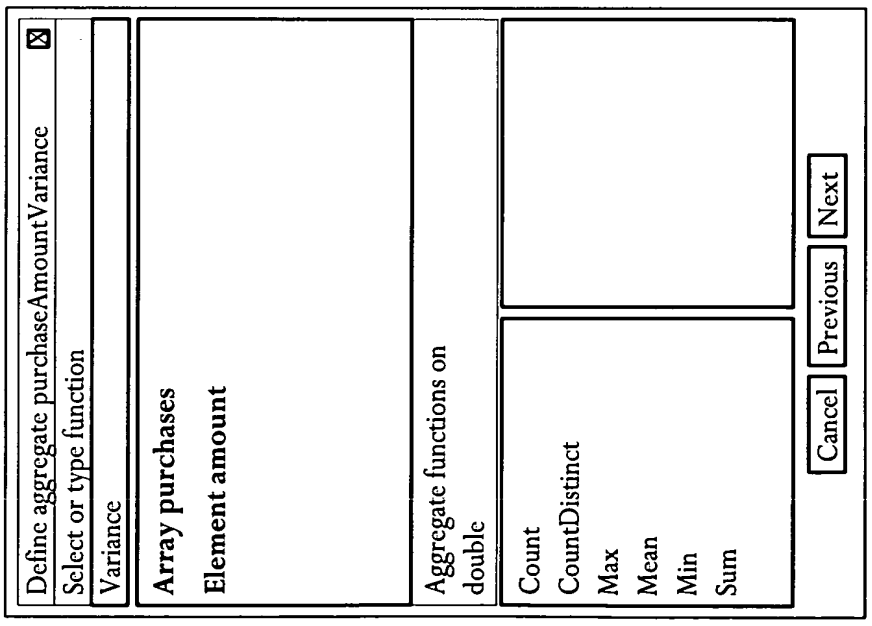

FIG. 13B

FIG. 13A